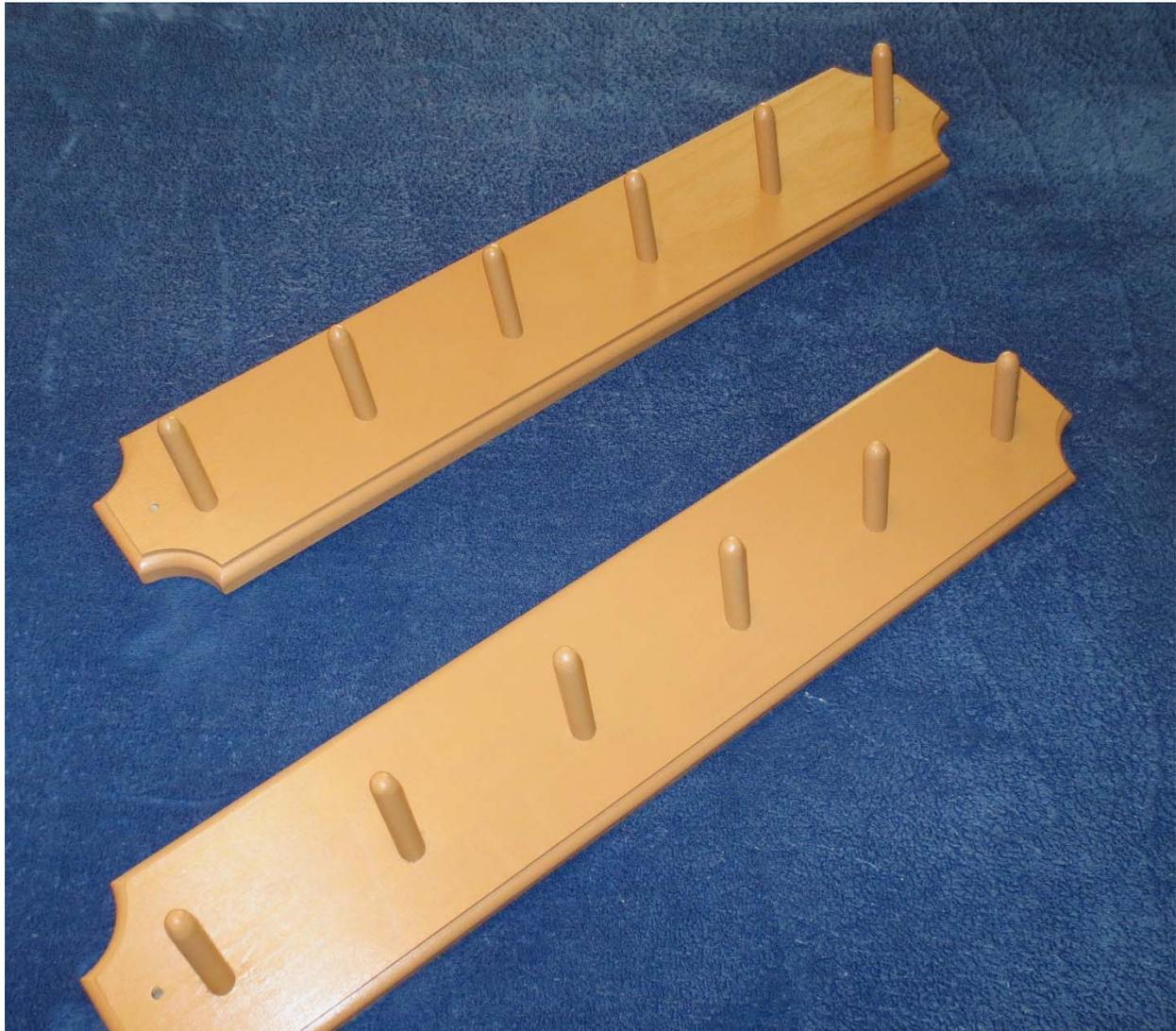


INSTRUCTIONS

for Building
A Clothes Rack



A Few Remarks About Making the Clothes Rack

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A WARNING - PLEASE READ

Woodworking can be dangerous! It's up to you to determine if you can safely use the tools and perform the tasks needed to complete this and any other woodworking project. If you are unsure, STOP! Get advice from someone knowledgeable or do some careful studying on your own. Be safe!

Always wear at least an appropriate N95 dust mask or respirator when sanding or spraying paint. For advice about dust masks and respirators, visit this link:
<https://woodworkingtoolkit.com/best-dust-masks-respirators/>

**READ, UNDERSTAND, AND FOLLOW ALL OF THE
INSTRUCTIONS AND WARNINGS THAT CAME
WITH YOUR TOOLS. BE CAREFUL!**

Why Build This Project?

This Clothes Rack is both a simple project and one that's particularly useful. You can build it in a day or two. Mount it behind a door, in a closet, or in a hallway to provide an added place for hanging clothes that you use often.

Make more than one for use in several places in your home. Or, give some as gifts.

The project comprises only the Base and 6 Pegs. The holes for the Pegs are all drilled the same way. The Pegs are all mounted the same way. It's easy!

Important Design Features of the Clothes Rack

- It's a good beginner's project
- Simple one-piece Base formed from solid poplar—or other, more decorative wood—measuring 3/4" x 4 1/2" x 24"
- Six Pegs with rounded ends
- Two 3/16" holes accept screws for simple mounting
- Paint it if you like or use a more natural finish

Details of the SketchUp File and Equivalent PDF File

File *One_Row_Clothes_Rack_02.skp* is the SketchUp design for the Clothes Rack. All of the dimensions and other necessary details are incorporated here. If you should find a dimension or other detail missing, it can be determined by examining this file. And, you can orbit and move the model around for a better look at everything.

File *One_Row_Clothes_Rack_02..pdf* contains all of the images and dimensions from the SketchUp file. Use this if you're not familiar with, or don't use, SketchUp.

The descriptions that follow will help to make clear the details of some of the components and construction so that possible misunderstandings might be avoided.

Use the Included SketchUp or PDF File to Follow Along with These Descriptions

There are only 2 pages in this design. The heading of each section below corresponds to the name of a particular SketchUp/PDF page.

Base Dimensions

All of the important Base dimensions are shown in this drawing. The first thing that you might notice is that the hole locations are set below the centerline of the Base. This was done so that the profile of each tilted Peg is centered on the centerline of the Base. The project would look funny if the holes were located on the centerline.

The actual holes for the Pegs are not shown. Instead, circles mark their nominal locations and the associated dimensions indicate the center point of each circle. That is, *the dimension for the peg locations indicate where the center of the drill should be placed when drilling each hole, starting from the front surface of the Base.*

There is a cutout at each corner of the Base. A template for cutting the corners is described below. You'll find a description of how to use it there, too.

A 3/16" through-hole is drilled near each end to facilitate mounting the Clothes Rack with a screw through each hole.

Peg Construction

There isn't much detail here except to notice that the distance that the Pegs extend from the front surface of the Base is 2" *measured perpendicularly from the front surface.*

The starting length dimension of each Peg is more than adequate to insert and locate the pin correctly and leave some of the peg extending from the back. The excess is trimmed off using a flush cutting saw.

Fabricating the Base

Sanding

Sand all surfaces of the Base and Pegs with at least 120-grit paper before assembly. You might want to go as high as 220-grit.

Don't sand the Pegs too much or they will fit loosely in the Base.

Cut the Base to Its Final Dimensions

Cut a piece of 3/4" poplar or other wood of your choice to the final dimension of 24" x 4 1/2".

Drill the Mounting Holes

Drill 3/16" holes where indicated on the *Base Dimension* page of the design drawing.

Drill the Holes for the Pegs

You do not want to attempt to drill the holes freehand. Prepare a jig like the one pictured in Figure 1 and Figure 2.

The jig is made to drill holes with an offset from vertical of 25°, the angle needed for the Pegs. Cut the ramps of the jig at an angle of 25° with a foot on each ramp to support the bottom edge of the Base.

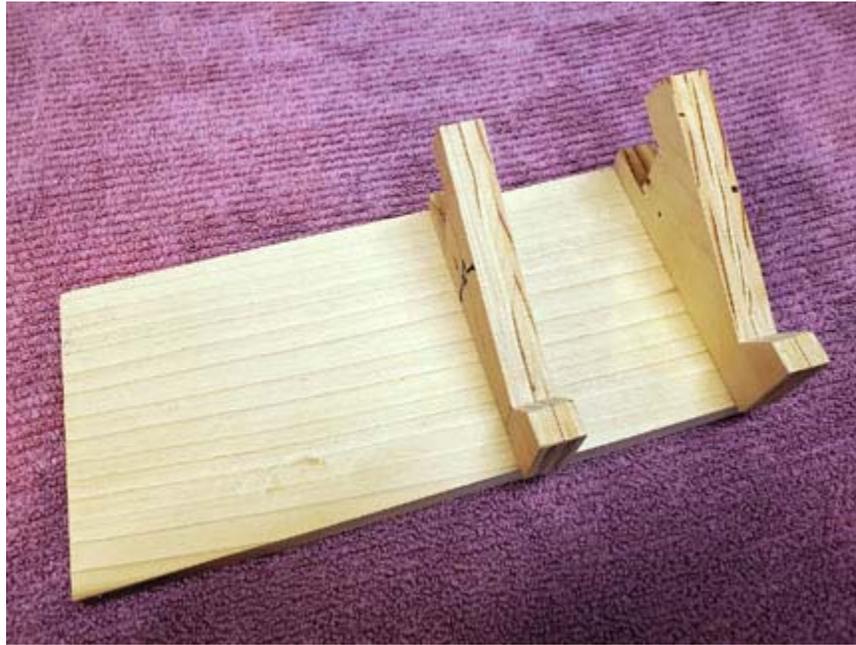


Figure 1. Top of 25° Template



Figure 2. Details of 25° Template

The notches visible in Figure 2 are there to provide a place to apply clamps to secure the Base during drilling. The ramps are located toward one end of the jig leaving a lot of area to apply clamps where the jig will be secured to the drill press table.

The ramps are secured to the jig using countersunk screws driven in from the bottom.

So how can you drill holes with a 1/2" drill bit and center it accurately? One way is to use a 1/2" *step* drill bit made by Kreg, the Kreg Jig® HD (Heavy-Duty) Drill Bit (<https://www.kregtool.com/store/c22/kreg-jigreg-accessories/p58/kreg-jig-hd-heavy-duty-drill-bit/>). See Figure 3. Other manufacturers make stepped bits, too.

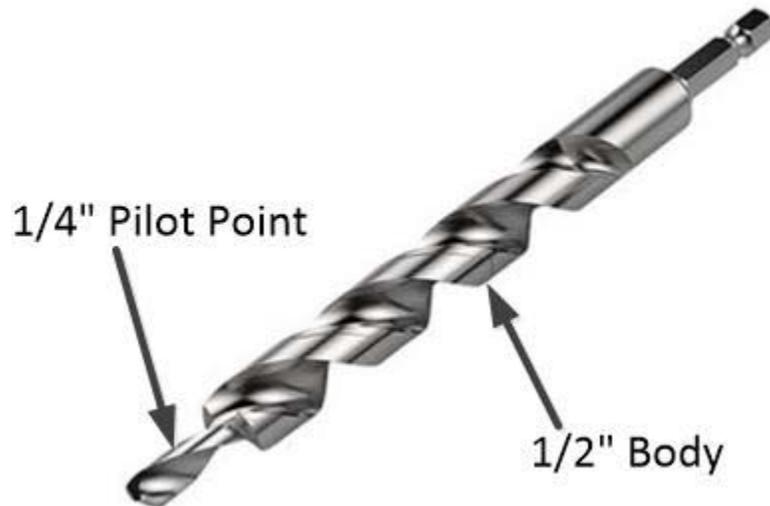


Figure 3. Kreg Jig® HD (Heavy-Duty) Drill Bit

The narrower point of the step drill bit makes it significantly easier to center at the correct location than a standard 1/2" bit. Tear out is minimized, too.

Drilling the Holes for the Pegs:

1. Mark the hole centers on the Base
2. Secure the step drill bit into your drill press chuck
3. Place the jig on your drill press table so that the area between the ramps is centered below the drill bit
4. Place the Base onto the jig
5. Locate the jig and the Base so that one of the marked hole centers is directly below the tip of the drill bit
6. Securely clamp the jig to the drill press table. It must not move during the entire drilling process.
7. Clamp the Base to the jig when the marked hole center is exactly directly below the tip of the drill bit
8. With everything safely secured, start the drill press and begin lowering the bit
9. Slowly begin penetrating the Base with the bit. It's important to move the bit slowly so that it begins to cut into the wood without deflecting due to the sloped Base.

10. Continue to slowly lower the bit as the 1/2" twist of the bit begins to cut into the wood. Slow is important here, too, in order to minimize tear out. Tear out on the back doesn't matter since it won't be seen.
11. Raise the bit out of the hole once it's complete
12. Turn the drill press off and wait for it to come to a complete stop
13. Leave the jig clamped to the drill press table but unclamp the Base
14. Slide the Base along the jig so that the next hole center is exactly directly below the tip of the bit and clamp the Base to the jig
15. Repeat Steps 8-14, continuing until all of the holes have been drilled

Cut Out the Hollow Corners

While you can cut the hollow corners of the Base freehand, the best results will be achieved by using a router with a template. Figure 4 and Figure 5 show a jig that's suitable for cutting the hollow corners.



Figure 4. Top of Hollow Corner Cutting Template



Figure 5. Bottom of Hollow Corner Cutting Template

I used 1/2" MDF (Medium Density Fiberboard) to fashion the template. MDF is good material for a template because it's easy to cut, sand, and shape.

Strips of MDF along two edges of the jig lie below the top edge so as not to interfere with the router. The strips extend below the bottom edge so they can fit against the edges of the Base to align the template.

Align the template on a corner of the Base and use a pencil to mark the profile onto the Base. Move the template to the other corners and repeat.

Now use a jigsaw or bandsaw to remove most of the waste material from each of the corners. Leave about 1/8" of material on the waste side of the line.

Now align the template on one corner of the Base and clamp both the jig and Base to your bench. Cut the profile using a router with a flush-cutting bit that has a bearing on one end that will ride along the template. Repeat at the other corners.

Round Over All of the Edges

You will probably want to add a final flourish to the Base to give it a more professional appearance. Now is the time to add a round-over, chamfer, or ogee edge using a router. I opted for a 3/8" round-over with a 1/8" step as illustrated in Figure 6.

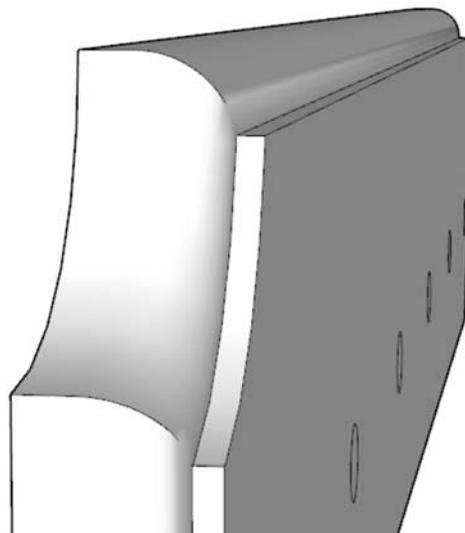


Figure 6. 3/8" Round-Over with 1/8" Step

Completing the Assembly

Preparing the Pegs

Round the end of each Peg. There are several ways to do this. I simply rounded them by eye using a disk sander.

Inserting and Gluing the Pegs

Have a gauge standing by to measure each peg to ensure that it extends exactly 2" perpendicular from the front surface of the Base. That is, the extension is not measured along the length of the Peg, but perpendicular to the front of the Base.

A suitable tool can be a 2" wide piece of wood, a try square, or a combination square. Whatever you choose to use, have it ready before beginning to insert the Pegs.

You should also have a hammer or mallet available for "persuading" the Pegs.

The Pegs are inserted from the back of the Base:

1. Force the first Peg into an end hole until it is extending about 1 1/2" from the front surface of the Base
2. Apply glue all around the surface of the Peg at the back of the Base
3. Force the Peg in until it's rounded tip is 2" from the front of the Base measured perpendicularly from the Base
4. Wipe away any excess glue from the back of the Base.

Insert and glue the other Pegs the same way.

Put the assembly aside to allow enough time for the glue to cure. If each of the Pegs was a snug fit, there is no need to wait for the glue to cure before proceeding with the next step.

Trimming the Excess Peg Length

All of the Pegs will extend out from the back of the Base. Use a flush-cutting saw to trim them flush with the Base. Sand as needed.

Applying a Finish

I chose to paint the *Clothes Rack*. You might want to apply a different finish, particularly if you used a wood that's more exotic than poplar.

I chose not to finish the back of the Rack. You might want to apply a finish to the back to help ensure that the Base won't warp or twist.